FULVOUS WHISTLING-DUCK *(Dendrocygna bicolor)*

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Criteria Scores

Pop. Trend	Range Trend	Pop. Size	Range Size	Endemism	Pop. Conc.	Threats
20	20	10	10	0	10	10

Special Concern Priority

Bird Species of Special Concern (breeding), Priority 1. Categorized as highest priority by Remsen (1978), and included on CDFG's (1992) unprioritized list.

Breeding Bird Survey Statistics for California

Data inadequate for trend assessment (Sauer et al. 2000).

General Range and Abundance

Nearly cosmopolitan, with populations in East Africa, Madagascar, India, Burma, Hawaii, the Caribbean, and throughout tropical America. Resident along Pacific coast of Mexico north to southern Sonora, where historically rare (Russell and Monson 1998). In North America, breeds in southeastern California (formerly to coastal and central California), coastal Texas, coastal Louisiana, and eastern Florida (Hohman and Lee 2001). Most populations believed stable, but declining in Madagascar and southern Asia (Scott and Rose 1996, Grimmett et al. 1990) and nearly extirpated from California. Fulvous whistling-ducks are prone to erratic, long-distance wanderings that may lead to dramatic range extensions if hospitable conditions are encountered; colonization of Florida and Cuba, and possibly Oahu, are recent examples (Bellrose 1980, Kaufmann 1996).

Most California breeders assumed to winter in western Mexico (Bellrose 1980, M. A.

Patten in litt.), although one banded in March 1956 at the Salton Sea, Imperial County, was recovered in November 1957 in southeast Texas (Bellrose 1980).

Seasonal Status in California

Generally sedentary outside the U.S. and in Florida, but the California, Texas, and Louisiana populations are largely migratory (Hohman and Lee 2001). Historically, fulvous whistling-ducks arrived at the Salton Sea in early to late March, but since 1985 earliest arrivals have been in April (Patten et al. in press). Southbound migration in California has tended to be relatively early, occurring mainly in August/September, and since 1988 this duck has not been recorded in the state past August (Patten et al. in press). The species wintered annually in the Imperial Valley through the 1970s, but now individuals or small flocks occur there only every few years (Patten et al. in press).

Historical Range and Abundance in California

Believed to have expanded northward into the U.S. during the second half of the nineteenth century (Hohman and Lee 2001). Vagrants or migrants have been recorded north to Marin, Solano, Sutter, and Inyo counties (Grinnell and Miller 1944). In 1879, marshes of the San Joaquin-Sacramento Delta west of Stockton spanned approximately 20 miles from east to west, and "a great many" fulvous whistling-ducks were seen flying northward through this area 5-7 May 1879 (Belding 1905). The species was not detected nesting there, however, and marshes of the delta were largely reclaimed and cultivated by around the turn of the century (Belding 1905).

The first confirmed U.S. breeding was near Los Banos, Merced County, in 1896 (Barnhart 1901). Establishment of extensive irrigation in this part of the San Joaquin Valley created particularly hospitable habitat for fulvous whistling-ducks for a period (Grinnell et al. 1918), and this "chief breeding ground" became one of few California locales where the species

was ever considered common (Grinnell and Miller 1944). Nesting in the Los Banos area continued through at least the early 1950s, when "pot holes along the San Joaquin River bottoms and some of the better duck club properties … produced a few broods of mallards, cinnamon teal and fulvous tree ducks" (1953 Merced National Wildlife Reserve [NWR] annual narrative, reported in Peters 2000).

Elsewhere, the species bred locally and/or sporadically at the south end of San Francisco Bay in Santa Clara County, in the southern San Joaquin and Imperial valleys, and on the southern Pacific slope. In the southern San Joaquin Valley, Kern County's Buena Vista Lake was a local center of abundance, with at least 50 nests in 1921, plus passage of "thousands" of migrants during favorable years (Dickey and van Rossem 1923). Willett (1933) reported two nests at Nigger Slough (Harbor Lake), Los Angeles County, in 1903, and small young seen in San Diego County's San Luis Rey River Valley in 1931. The latest reported coastal breeding was at Playa del Rey, Los Angeles County, in the early 1950s (Garrett and Dunn 1981).

Recent Range and Abundance in California

By the early 1960s only two small breeding colonies remained: near the Salton Sea, Imperial County, and near Mendota, Fresno County (William Anderson in McCartney 1963). At the Salton Sea, high fall counts included 240 to 300 from 15 August to 9 September 1949 (Patten et al. in press), 500 on 9 September 1950 (W. Anderson unpubl. data in McCartney 1963), and approximately 460 in early September 1951 (Patten et al. in press). At the Mendota Waterfowl Management Area, 136 fulvous whistling-ducks were recorded in the harvest from 1955 to 1960, a number that dropped to 35 from 1960 to 1970, with just one reported in the harvest since 1980 (Peters 2000).

Fulvous whistling-ducks now breed regularly only in the Imperial Valley, around Finney

and Ramer lakes, and at the Alamo River delta near Red Hill (Patten et al. in press). During the 1990s, fewer than five pairs are believed to have bred in these areas, and breeding was not observed in 2000 or 2001 (Patten et al. in press). Wet years from 1983 through 1992 produced scattered records in the San Joaquin Valley. In 1983, two broods, plus 7-9 possibly adult birds, were found in flooded barley fields in the Tulare Lake Basin, Kings County, with another brood at the Kern NWR, Kern County (G. Gerstenberg pers. comm.). In both May 1984 and May 1985, approximately ten adults were seen at Mendota Pool, located at the junction of Fresno Slough and the San Joaquin River (J. Seay in litt.). Just south of there, at the Mendota Waterfowl Management Area, the most recent records (all adults) are of nine in August 1990, three in August 1991 (S. Brueggemann pers. comm., reported in Peters 1998), and two on 26 April 1992 (J. Seay in litt.).

Since the species is reportedly "among the most abundant of captive waterfowl" (Todd 1996), occasional sightings away from known and potential breeding areas in the San Joaquin and Imperial valleys -- particularly those in coastal areas -- may involve escapees (Garrett and Dunn 1981, Lehman 1994, Hamilton and Willick 1996). Naturally, the species' propensity for long-distance wanderings, particularly after the breeding season, must also be considered.

Ecological Requirements

In the U.S., most fulvous whistling-ducks occupy freshwater wetlands, particularly rice fields and tall-grass areas flooded to a depth of < 0.5 m, with some use of adjacent uplands (McCartney 1963, Hohman and Lee 2001). Rice fields heavily infested with weeds were found to be preferred for both feeding and nesting (Meanley and Meanley 1959). Freshwater marshes with dense stands of emergent vegetation and open-water areas with floating aquatic plants are used "to a much lesser extent" (Hohman and Lee 2001), although such habitats are regularly used in

the Imperial Valley (Patten et al. in press). Nests typically constructed of marsh grasses and sedges (*Carex* spp.) over water within emergent swamps, and on dry hummocks between ponds (Shields 1899). The nest may have an overhanging canopy of vegetation and a ramp of vegetation leading to the nest cup, which is often lined with fine grasses instead of the more usual down (Shields 1899, Bent 1925, Bellrose 1980).

Pair-bonds probably extend beyond one season and may last for life (Todd 1996). Clutch size is 9-15 eggs, but "dump nests" with up to 100 eggs have been reported (Shields 1899, Todd 1986). In Louisiana, the minimum incubation period of 24-25 days often increases due to brood parasitism (Meanley and Meanley 1959). Both parents incubate the eggs and care for the ducklings, which fledge at approximately 63 days (Hohman and Lee 2001). In California, fledging expected mainly from late July into August (Peters 2000). One of the 1983 Tulare Lake Basin broods mentioned previously had five newly hatched young on 24 June, and three partially feathered young dying of avian botulism were collected on 9 August (G. Gerstenberg unpubl. data in Peters 2000), suggesting that these broods would have fledged by late August. Two of the Tulare Lake Basin specimens were preserved, one at Humboldt State University and the other at Reedley College near Fresno (G. Gerstenberg pers. comm.).

Fulvous whistling-ducks feed nocturnally and are almost totally granivorous as adults, the seeds of various grasses, sedges, and other emergent vegetation being obtained by dabbling and diving (Landers and Johnson 1976, Hohman and Lee 2001). The types of seeds ingested vary depending on availability, and whether the habitat selected is natural or agricultural (Hohman and Lee 2001). Preference for rice widely noted, although "rice ingestion by individuals was substantially reduced in dry- versus water-seeded fields in sw. Louisiana" (Meanley and Meanley 1959 in Hohman and Lee 2001) and fulvous whistling-ducks may be "valuable to the

farmer in consuming seeds of rice-field weeds" (Lynch 1941 in Peters 2000). In Louisiana, "Aquatic earthworms (Oligochaeta) were the only animal food contributing appreciably to the diet" (Hohman et al. 1996, reported in Hohman and Lee 2001). Duckling diet poorly known, but may contain a higher proportion of aquatic animals (Turnbull et al. 1989a, Hohman and Lee 2001).

Threats

Extensive water diversion and drainage of permanent marshes for agriculture were a major cause of the decline in abundance and distribution in California in the mid 1900s (Remsen 1978), and wetland drainage and conversion continue as threats in the Imperial Valley (M. A. Patten in litt.).

Hunting is not of present concern in California, although the harvest may have been considerable in years when the birds remained in the state into October (Grinnell et al. 1918, Dickey and van Rossem 1923). Shooting on the wintering grounds may now pose a threat, with fulvous whistling-ducks accounting for "9% of the waterfowl harvest in Sinaloa, Mexico" (Migoya and Baldassarre 1993 in Hohman and Lee 2001).

Contamination by the pesticide aldrin severely depleted Texas and Louisiana populations in the 1960s and 1970s (Flickinger and King 1972), and elevated aldrin levels were present in seven of 15 adults collected in Texas in spring 1983 (Flickinger et al. 1986), nine years after the substance was banned in the U.S. In 1984-85, low levels of organochlorines and organophosphates were found in 29 of 30 specimens from south Florida (Turnbull et al. 1989b), with contamination suspected to originate in U.S. and other countries (Hohman and Lee 2001). Harm from toxic substances is not known in California, but the threat has not been assessed; perhaps more importantly, contamination on the wintering grounds may have major effects on the California population.

Avian botulism killed three young ducks in the Tulare Lake Basin in 1983 (G. Gerstenberg unpubl. data in Peters 2000) and at least two birds at the Salton Sea from 1996-2001 (U.S. Fish and Wildlife Service unpubl. data). These are small numbers, but the population is very small and additional afflicted birds may not have been found.

Management and Research Recommendations

In the Imperial Valley, fulvous whistling-ducks could benefit from protection of occupied and potentially suitable nesting and foraging areas, and from restoration/creation of additional suitable habitat areas. In addition, studies should be undertaken to assess contamination risks.

Remsen (1978) recommended providing additional wetland habitats that remain flooded through the spring and summer to help recover breeding populations of both fulvous whistling-ducks and white-faced ibis (*Plegadis chihi*). Recent estimates of potentially suitable nesting habitats in Merced and Fresno counties identified 6,000 acres of wetlands and about 10,000 acres planted to rice, and while several thousand white-faced ibis now nest in these areas fulvous whistling-ducks have not responded in kind (Peters 2000). Perhaps not enough birds now return to California to permit successful colonization of such areas. A detailed assessment of habitat suitability may be warranted to determine whether pesticides, food availability, nesting substrate, or some other factor(s) prevent fulvous whistling-ducks from using seemingly appropriate habitat in the San Joaquin Valley.

Consideration should be given to managing additional San Joaquin Valley wetlands, particularly those in federal and state refuges, to remain flooded through the spring and summer while identifying and preserving areas of suitable nesting substrate.

Remsen (1978) recommended hunting restrictions on fulvous whistling-ducks, and such a ban may be an important component of any plan to re-establish the species, either actively

through re-introduction or passively through habitat preservation and manipulation.

Peters (2000) proposed transplanting fulvous whistling-ducks from Louisiana to sites in the San Joaquin Valley over a three year period. This would involve collecting and incubating a number of eggs, as well as capture of adult birds and their flightless young. If such a management approach is deemed worthwhile and ecologically appropriate, a detailed habitat assessments should first be undertaken at potential release sites to help ensure their suitability for breeding by fulvous whistling-ducks. Future management of receiver sites should emphasize actions that promote maintaining viable whistling-duck populations into the future.

Monitoring Needs

California's presently miniscule fulvous whistling-duck population cannot be monitored by traditional waterfowl census methods (e.g., aerial surveys). Personnel of the Salton Sea NWR and Imperial Wildlife Area should coordinate annual ground surveys of suitable breeding habitat on public and private wetlands in the Imperial Valley.

To determine whether any breeding pairs persist in the San Joaquin Valley, five years of similar surveys should be undertaken at potentially suitable wetlands and rice fields (during years when potentially suitable habitat is present at a given area) north to the vicinity of Los Banos, Merced County.

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